



RIC 2011
Adequacy of Station Electric Distribution System
Voltages—Degraded Voltage Protection

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March 9, 2011

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Degraded Voltage
A Regional Perspective

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Inspection Identified Issues

- **Unacceptably long time delays**
- Time delay not represented in LOCA Response Time Analysis.
- Potential for:
 - Tripping of circuit breakers powering safety related loads.
 - Stalling and/or damage of motors.
- Incorrect reliance on automatic tap changers

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Inspection Identified Issues

- **Unacceptably long time delays (Cont.)**
- Long time delays with auto DVR actuation if LOCA occurs.
 - Inadequate for normally running safety related motors not rated for low voltages.
 - Potential tripping, stalling, damage.

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Inspection Identified Issues (Cont.)

- **Inadequate Low Voltage settings**
- DVR voltage not set conservatively
- TS 3.8.1, AC Sources, Operability
 - Operating (grid) voltage inadequate to ensure offsite power is available during a LOCA
 - Usually tied to 27 device (undervoltage relay) reset value

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Inspection Identified Issues (Cont.)

- **Inadequate Low Voltage settings (Cont.)**
- Low voltages at motor terminals
- Low voltages at MCCs causing contactor dropout

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Inspection Identified Issues (Cont.)

- **Peripheral Issues**
 - Inadequately sized transformers resulting in low voltages during equipment block starts.
 - EDG voltage fluctuations during safety related motors starts.

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Regulatory Pathway

- **10 CFR 50, Appendix B, Design Control**
- **Backfit Analysis**
 - Compliance Backfit
 - Performed on one plant in Region III.
 - Safety Backfit
 - Safety and risk significant.
 - Compliance backfit issue in Region III was also preliminarily White for risk significance.

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